

What is claimed is:

1 1. A chuck device for containers comprising:

2 supporting means;

3 a pair of arms rotatably supported on said supporting means by way of a pair of arm
4 shafts, chuck claws for grasping a container being disposed on ends of said pair of arms
5 that open and close in tandem with a rotation around said arm shafts; and

6 an operation member capable of being operated on from outside;

7 wherein:

8 inward from said pair of arms is disposed a first drive section capable of integrally
9 rotating around said arm shaft of a first arm and integrally with said first arm, and a second
10 drive section disposed further toward said end of said arm than said first drive section and
11 capable of rotating integrally around said arm shaft of a second arm and integrally with said
12 second arm;

13 biasing means biases said pair of arms around said arm shafts in a direction of
14 closing said ends of said arms;

15 a motion input mechanism is disposed between said operation member and said first
16 drive section and converts motion accompanying operation of said operation member from
17 outside to a rotation motion of said first drive section centered around said arm shaft; and

18 a coupling mechanism is disposed between said first drive section and said second
19 drive section and converts rotational motion of said drive section around said arm shaft to a
20 rotational motion of said second drive section around said arm shaft.

1 2. A chuck device as described in claim 1 wherein said motion input mechanism uses a cam
2 mechanism to convert a motion of said operation member to rotation motion of said first
3 drive section.

1 3. A chuck device as described in claim 2 wherein:

2 said cam mechanism of said motion input mechanism is equipped with an arm drive
3 cam supported by said supported means to allow rotation around a cam axis line parallel to
4 said arm shaft, a cam surface being formed on an outer perimeter of said arm drive cam;

5 said arm drive cam is disposed opposite from said second drive section relative to
6 said first drive section;

7 said arm drive cam is rotated by operation of said operation member from outside;

8 as said arm drive cam rotates, said cam surface of said arm drive cam moves back
9 and forth between a position where said first drive section is pushed out toward said second
10 drive section and a position where said first drive section is retracted to an opposite side
11 from said second drive section.

1 4. A chuck device as described in claim 3 wherein a first roller that comes into contact with
2 said cam surface of said arm drive cam is disposed on said first drive section.

1 5. A chuck device as described in claim 3 wherein:

2 a roller shaft parallel to said arm shaft is disposed on said first drive section; and

3 on said roller shaft, there is disposed a first roller coming into contact with said cam
4 surface of said arm drive cam, and a second roller coming into contact with said second
5 drive section.

1 6. A chuck device as described in any one of claim 3 through claim 5 wherein a support
2 section is disposed on said cam surface of said arm drive cam to support said first drive
3 section at said position pushed out toward said second drive section.

1 7. A chuck device as described in any one of claim 1 through claim 6 wherein said coupling
2 mechanism uses a cam mechanism to convert rotation motion of said first drive section to
3 rotation motion of said second drive section.

1 8. A chuck device as described in claim 7 wherein said cam mechanism of said coupling
2 mechanism is equipped with a cam surface disposed on said second drive section and
3 coming into contact with said first drive section.

1 9. A chuck device as described in any one of claim 1 through claim 8 wherein said biasing
2 means includes spring means disposed between said support means and said second arm
3 and biasing said second arm so that said chuck claws are biased in a closing direction.

1 10. A chuck device as described in any one of claim 1 through claim 8 wherein said biasing
2 means includes torsion coil springs on each of said pair of arm shafts to bias said pair of
3 arms so that said ends are biased in a closing direction.

1 11. A chuck device as described in claim 3 wherein:
2 as said biasing means, torsion coil springs are disposed on each of said pair of arm
3 shafts to bias said pair of arms so that said ends are biased in a closing direction; and
4 both ends of a cam shaft rotatably supporting said pair of arm shafts and said arm
5 drive cam are supported by said supporting means.

1 12. A conveyor device for containers comprising:
2 a chuck device as described in any one of claim 1 through claim 11; and
3 a mobile body moving said support means of said chuck device along a
4 predetermined conveyor path.

1 13. A conveyor device as described in claim 13 wherein a plurality of said chuck devices
2 are disposed on said mobile body along said conveyance path.

1 14. A conveyor device as described in claim 13 or claim 14 wherein an operation section is
2 disposed along said conveyance path that comes into contact with said operation member
3 when said chuck device moves.

1 15. A conveyor device as described in claim 14 wherein said operation section includes a
2 movable section capable of moving between an active position, where said operation
3 section is in contact with said operation member and operates said operation member, and a
4 stand-by position away from said operation member.

1 16. A conveyor device as described in claim 15 wherein said movable section is driven by
2 an electrical servo motor between said active position and said stand-by position.

1 17. In a chuck device wherein a chuck claw is removably mounted on an end of an arm
2 driven to perform a grasping action,
3 a chuck device wherein:
4 a cylindrically indented bearing surface is disposed on said arm;
5 a holding piece equipped with a cylindrical outer perimeter surface curved along
6 said bearing surface is disposed on said bearing surface using tightening means; and
7 an attachment base curved along said bearing surface and capable of being inserted
8 between said support piece and said bearing surface is disposed on said chuck claw.

1 18. A chuck device as described in claim 17 wherein said tightening means is a bolt.

1 19. A chuck device as described in claim 18 wherein a slit is formed on said attachment
2 base of said chuck claw to allow said bolt to pass through.

1 20. A chuck device as described in claim 18 or claim 19 wherein:
2 a chuck bearing is disposed on said arm to receive reaction generated on said chuck
3 claw during said grasping action;
4 said bearing surface is formed to connect with a side of said chuck bearing section
5 that comes into contact with said chuck claw;

6 said bolt is set up to attach to said bearing surface in such a direction that, going
7 toward a rear end of said arm, said bolt extends from said bearing surface toward a back
8 surface relative to a side of said arm in contact with said chuck claw.

1 21. A chuck device as described in claim 20 wherein:

2 an arm shaft rotatably supporting said arm is disposed behind said bearing surface;
3 and

4 said bolt is screwed in between said bearing surface and said arm shaft.

1 22. A chuck device as described in claim 20 or claim 21 wherein:

2 left and right arms are disposed;

3 a bearing surfaces is disposed inward from each arm;

4 said bolts pass through said support pieces from inward of said arms and are
5 screwed into said arms; and

6 slits are disposed at ends of said chuck claws to allow insertion of a tool used to
7 manipulate said bolts.

1 23. A chuck device as described in claim 22 wherein spring means is disposed between said
2 support pieces attached to said bearing surfaces of said arms to draw said support pieces
3 toward each other.

1 24. A chuck claw wherein:

2 a grasping section performing grasping actions is formed on a first end; and

3 an attachment base curved to form a cylindrical surface is formed on a second.

1 25. A chuck claw as described in claim 24 wherein a slit extending in a perimeter direction
2 of a cylindrical surface defined by said attachment base is disposed on said attachment base.

1 26. A chuck claw as described in claim 24 or claim 25 wherein a slit that divides said
2 grasping section along a direction of an axis of a cylindrical surface defined by said
3 attachment base is formed on said grasping section.

1 27. A conveyor device comprising:
2 a mobile body capable of pivoting around a predetermined center; and
3 a chuck device as described in any one of claim 17 through claim 23;
4 wherein a plurality of said chuck devices are disposed along an outer perimeter of
5 said mobile body.